CAD

Index to Volume 33 (2001)

No 1 (January) pp 1–124
No 2 (February) pp 125–196
No 3 (March) pp 197–278
No 4 (April) pp 279–344
No 5 (April) pp 345–420
No 6 (May) pp 421–488
No 7 (June) pp 489–560
No 8 (July) pp 561–618
No 9 (August) pp 619–686
No 10 (September) pp 687–750
No 11 (September) pp 751–852
No 12 (October) pp 853–912
No 13 (November) pp 913–1022
No 14 (December) pp 1023–1122

Article Index

No 1

A constant feed and reduced angular acceleration interpolation algorithm for multi-axis machining
R. V. Fleisig and A. D. Spence 1

Derivation of a standard set of geometric constraints for parametric modeling and data exchange
B. Bettig and J. Shah 17

Planar point set fairing and fitting by arc splines
X. Yang and G. Wang 35

Analysis of difference fairing based on DFT-filter
S. K. Cho and B. K. Choi 45

Surface swept by a toroidal cutter during 5-axis machining
D. Roth, S. Bedi, F. Ismail and S. Mann 57

A process planning method for improving build performance in stereolithography
A. P. West, S. P. Sambu and D. W. Rosen 65

Towards valid parametric CAD models
C. M. Hoffmann and K.-J. Kim 81

Solid reconstruction from orthographic views using 2-stage extrusion
S. S. P. Shum, W. S. Lau, M. M. F. Yuen and K. M. Yu 91

Constrained scaling of trimmed NURBS surfaces based on fix-and-stretch approach
C. Zhang, P. Zhang and F. Cheng 103

On swept volume formulations: implicit surfaces
K. Abdel-Malek, J. Yang and D. Blackmore 113

No 2

Approximate merging of a pair of Bézier curves
S.-M. Hu, R.-F. Tong, T. Ju and J.-G. Sun 125

Virtual prototyping of mold design: geometric mouldability analysis for near-net-shape manufactured parts by feature recognition and geometric reasoning
Z. Yin, H. Ding and Y. Xiong 137

Exact Taylor series coefficients for variable-feedrate CNC curve interpolators
R. T. Farouki and Y.-F. Tsai 155

Curve and surface fitting and design by optimal control methods
M. Alhanaty and M. Bercovier 167

Cloud data modelling employing a unified, non-redundant triangular mesh
W. Sun, C. Bradley, Y. F. Zhang and H. T. Loh 183

No 3

Towards curvilinear meshing in 3D: the case of quadratic simplices
S. Dey, R. M. O'Bara and M. S. Shephard 199

Hex-dominant mesh generation using 3D constrained triangulation
S. J. Owen 211

Feature based hex meshing methodology: feature recognition and volume decomposition
Y. Lu, R. Gadh and T. J. Tautges 221

Unstructured 20-node brick element meshing
G. D. Dhondt 233

Face clustering of a large-scale CAD model for surface mesh generation
K. Inoue, T. Itoh, A. Yamada, T. Furuhata and K. Shimada 251

Terminal-edges Delaunay (small-angle based) algorithm for the quality triangulation problem
M.-C. Rivara, N. Hitschfeld and B. Simpson 263

No 4

Computing and visualizing pose-interpolating 3D motions
J. R. Rossignac and J. J. Kim 279

A G^1 connection around complicated curve meshes using C^1 NURBS Boundary Gregory Patches
K. Konno, Y. Tokuyama and H. Chiyokura 293

CNC tool path in terms of B-spline curves
C. Lartigue, F. Thiebaut and T. Maekawa 307

Rational Bézier form of hodographs of rational Bézier curves and surfaces
D.-S. Kim, T. Jang, H. Shin and J. Y. Park 321

The development of a layer based machining system
Y. H. Chen and Y. Song 331

PII: S0010-4485(01)00166-X

No 5

Designer chaos
M. Field 349

IDSET: Interactive Design System using Evolutionary Techniques
T. Sato and M. Hagiwara 367

Synthetic carving using implicit surface primitives
A. Pasko, V. Savchenko and A. Sourin 379

Surface design using hand motion with smoothing
J. Dorman and A. Rockwood 389

A novel haptics-based interface and sculpting system for physics-based geometric design
F. Dachille IX, H. Qin and A. Kaufman 403

No 6

Fuzzy mapping of requirements onto functions in detail design
C.-X. (Jack) Feng, P.-G. Li and M. Liang 425

Geometry based triangulation of multiple trimmed NURBS surfaces
G. V. V. Ravi Kumar, P. Srinivasan, K. G. Shastry and B. G. Prakash 439

Construction of feature volumes using intersection of adjacent surfaces
D. Sandiford and S. Hinduja 455

Sequential constraint imposition for dimension-driven solid models
A. V. Kumar and L. Yu 475

No 7

Product data markup language: a new paradigm for product data exchange and integration
W. C. Burkett 489

A generic framework for transforming EXPRESS information models
H. Kahn, N. Filer, A. Williams and N. Whitaker 501

Requirements management: a representation scheme for product specifications
A. McKay, A. de Pennington and J. Baxter 511

Mapping product structures between CAD and PDM systems using UML
Y. Oh, S.-h. Han and H. Suh 521

A shape modelling applications programming interface for the STEP standard
M. J. Pratt and B. D. Anderson 531

A foundation for interoperability in next-generation product development systems
S. Szykman, S. J. Fenves, W. Keirouz and S. B. Shooter 545

No 8

Interference detection for 3-axis mold machining
X. M. Ding, J. Y. H. Fuh and K. S. Lee 561

Boundary extraction algorithm for cutting area detection
S. C. Park and B. K. Choi 571

Geodesic curvature preservation in surface flattening through constrained global optimization
P. N. Azariadis and N. A. Aspragathos 581

Parametrization for surface fitting in reverse engineering
L. A. Piegl and W. Tiller 593

A volume decomposition approach to machining feature extraction of casting and forging components
S. B. Kailash, Y. F. Zhang and J. Y. H. Fuh 605

No 9

Operation decomposition for freeform surface features in process planning
G. Sun, C. H. Sequin and P. K. Wright 621

Internet-based collaborative product design with assembly features and virtual design spaces
N. Shyamsundar and R. Gadh 637

A feature-based inspection and machining system
T. R. Kramer, H. Huang, E. Messina, F. M. Proctor and H. Scott 653

STEP-based feature recognition for manufacturing cost optimization
J. Han, M. Kang and H. Choi 671

No 10

A face based mechanism for naming, recording and retrieving topological entities
J. Wu, T. Zhang, X. Zhang and J. Zhou 687

Function-to-form mapping: model, representation and applications in design synthesis
U. Roy, N. Pramanik, R. Sudarsan, R. D. Sriram and K. W. Lyons 699

A mechanism for validating dimensioning and tolerancing schemes in CAD systems
T. Kandikjan, J. J. Shah and J. K. Davidson 721

Uncut free pocketing tool-paths generation using pair-wise offset algorithm
S. C. Park and B. K. Choi 739

No 11

Constructing polygonal complexes with shape handles for curve interpolation by subdivision surfaces
A. H. Nasri 753

Mesh fairing based on an intrinsic PDE approach
R. Schneider and L. Kobbelt 767

Remeshing triangulated surfaces with optimal parameterizations
K. Hormann, U. Labsik and G. Greiner 779

Mesh regularization and adaptive smoothing
Y. Ohtake, A. Belyaev and I. Bogaevski 789

Approximate shortest path on a polyhedral surface and its applications
T. Kanai and H. Suzuki 801

Trimming analytic functions using right sided Poisson subdivision
G. Morin and R. Goldman 813

Surface slicing algorithm based on topology transition
C.-S. Jun, D.-S. Kim, H.-C. Lee, J. Hwang and T.-C. Chang 825

Algorithms for reverse engineering boundary representation models
P. Benkő, R. R. Martin and T. Várady 839

No 12

A CAD integrated analysis of flatness in a form tolerance zone
T. B. Teck, A. Senthil Kumar and V. Subramanian 853

Conic approximation of planar curves
Y. J. Ahn 867

A linear-time, constant-space algorithm for computing the spanning line segments in three dimensions
K.-L. Chung, S.-M. Chang and T. C. Woo 873

A generic approach for nesting of 2-D parts in 2-D sheets using genetic and heuristic algorithms
A. Ramesh Babu and N. Ramesh Babu 879

Shape control of swept surface with profiles
G.-p. Wang and J.-g. Sun 893

Modifying the shape of NURBS surfaces with geometric constraints
S.-M. Hu, Y.-F. Li, T. Ju and X. Zhu 903

No 13

Fairing spline curves and surfaces by minimizing energy
C. Zhang, P. Zhang and F. Cheng 913

Model simplification for meshing using face clustering
A. Sheffer 925

Real-time interference analysis between a tool and an environment
S. Ho, S. Sarma and Y. Adachi 935

Intelligent dimensioning for mechanical parts based on feature extraction
K.-Z. Chen, X.-A. Feng and Q.-S. Lu 949

Choosing nodes and knots in closed B-spline curve interpolation to point data
H. Park 967

Streamline modeling with subdivision surfaces on the Gaussian sphere
K. T. Miura, L. Wang and F. Cheng 975

Modeling methods for the design of 3D broadcloth composite parts
M. Aono, D. E. Breen and M. J. Wozny 989

A machining strategy for toolmaking
A. Flutter and J. Todd 1009

No 14

A hybrid method for recognition of undercut features from moulded parts
X. G. Ye, J. Y. H. Fuh and K. S. Lee 1023

Mapping of tubular woven composite preforms on to doubly-curved surfaces
S. B. Sharma, P. Potluri, J. Atkinson and I. Porat 1035

An approximation approach of the clothoid curve defined in the interval $[0, \pi/2]$ and its offset by free-form curves
L. Z. Wang, K. T. Miura, E. Nakamae, T. Yamamoto and T. J. Wang 1049

Reconstruction of curved solids from engineering drawings
S.-X. Liu, S.-M. Hu, Y.-J. Chen and J.-G. Sun 1059

A feature-based approach to injection mould cooling system design
C. L. Li 1073

Motif analysis for automatic segmentation of CT surface contours into individual surface features
S. Liu and W. Ma 1091

A case base of Case-Based Design tools for architecture
A. Heylighen and H. Neuckermans 1111

Author index

Abdel-Malek, K. 113
Adachi, Y. 935
Ahn, Y. J. 867
Alhanaty, M. 167
Anderl, R. 3
Anderson, B. D. 531
Aono, M. 989
Aspragathos, N. A. 581
Atkinson, J. 1035
Azariadis, P. N. 581

Baxter, J. 511
Bedi, S. 57
Belyaev, A. 789
Benkő, P. 839
Bercovier, M. 167
Bettig, B. 17
Blackmore, D. 113
Bogaevski, I. 789
Bradley, C. 183
Breen, D. E. 989
Burkett, W. C. 489

Chang, S.-M. 873
Chang, T.-C. 825
Chen, K.-Z. 949
Chen, Y. H. 331
Chen, Y.-J. 1059
Cheng, F. 913
Cheng, F. 103, 975
Chiyokura, H. 293
Cho, S. K. 45
Choi, B. K. 45, 571, 739
Choi, H. 671
Chung, K.-L. 873
Clark, D. E. R. 343

Dachille, F. 403
Davidson, J. K. 721
de Pennington, A. 511
Dey, S. 199
Dhondt, G. D. 233
Ding, H. 137
Ding, X. M. 561
Dorman, J. 389

Farouki, R. T. 155
Feng, C.-X. 425
Feng, X.-A. 949
Fenves, S. J. 545
Field, M. 349
Filer, N. 501
Fleisig, R. V. 1
Flutter, A. 1009
Fuh, J. Y. H. 561, 605, 1023
Furuhata, T. 251

Gadh, R. 221, 637
Goldman, R. 813
Greiner, G. 779
Gupta, S. K. 619

Hagiwara, M. 367
Han, J. 671
Han, S.-h. 521
Heylighen, A. 1111
Hinduja, S. 455
Hitschfeld, N. 263
Ho, S. 935
Hoffmann, C. M. 81
Hormann, K. 779
Hu, S.-M. 125, 903, 1059
Huang, H. 653
Hwang, J. 825

Inoue, K. 251
Ismail, F. 57
Itoh, T. 251

Jang, T. 321
Joan-Arinyo, R. 123
Ju, T. 125, 903
Jun, C.-S. 825

Kahn, H. 501
Kailash, S. B. 605
Kanai, T. 801
Kandikjan, T. 721
Kang, M. 671
Kaufman, A. 403
Keirouz, W. 545
Kim, D.-S. 321, 825, 825
Kim, J. J. 279
Kim, K.-J. 81
Kobbelt, L. 767
Konno, K. 293
Kramer, T. R. 653
Kumar, A. V. 475

Labsik, U. 779
Lartigue, C. 307
Lau, W. S. 91
Lee, H.-C. 825
Lee, K. 487
Lee, K. S. 561, 1023
Li, C. L. 1073
Li, P.-G. 425
Li, Y.-F. 903
Liang, M. 425
Liu, S. 1091
Liu, S.-X. 1059
Loh, H. T. 183
Lu, Q.-S. 949
Lu, Y. 221
Lyons, K. W. 699

Ma, W. 1091
Maekawa, T. 307
Mann, S. 57
Martin, R. R. 839
McKay, A. 511
Messina, E. 653
Miura, K. T. 975, 1049
Morin, G. 813

Nakamae, E. 1049
Nasri, A. H. 753
Neuckermans, H. 1111

O'Bara, R. M. 199
Oh, Y. 521
Ohtake, Y. 789
Owen, J. 3
Owen, S. J. 211

Park, H. 967
Park, J. Y. 321
Park, S. C. 571, 739
Pasko, A. 379
Piegl, L. A. 593
Porat, I. 1035
Potluri, P. 1035
Prakash, B. G. 439
Pramanik, N. 699
Pratt, M. J. 531
Proctor, F. M. 653

Qin, H. 403

Ramesh Babu, A. 879
Ramesh Babu, N. 879
Ravi Kumar, G. V. V. 439
Regli, W. C. 619
Rivara, M.-C. 263
Rockwood, A. 389
Rosen, D. W. 65
Rossignac, J. R. 279
Roth, D. 57
Roy, U. 699

Sambu, S. P. 65
Sandiford, D. 455
Sapidis, N. 747
Sarma, S. 935
Sato, T. 367
Savchenko, V. 379
Schneider, R. 767
Scott, H. 653
Senthil Kumar, A. 853
Sequin, C. H. 345, 621
Shah, J. J. 17, 721
Sharma, S. B. 1035
Shastry, K. G. 439
Sheffer, A. 925
Shephard, M. S. 199
Shimada, K. 197, 251
Shin, H. 321
Shooter, S. B. 545
Shum, S. S. P. 91
Shyamsundar, N. 637
Simpson, B. 263
Song, Y. 331
Sourin, A. 379
Spence, A. D. 1, 195
Srinivasan, P. 439
Sriram, R. D. 699
Subramanian, V. 853
Sudarsan, R. 699
Suh, H. 521
Sun, G. 621
Sun, J.-G. 125, 893, 1059
Sun, W. 183
Suzuki, H. 801
Szykman, S. 545

Tautges, T. J. 221
Teck, T. B. 853
Thiebaut, F. 307
Tiller, W. 593
Todd, J. 1009
Tokuyama, Y. 293
Tong, R.-F. 125
Tsai, Y.-F. 155

Várady, T. 839

Wang, G. 35, 749
Wang, G.-p. 893
Wang, L. 975
Wang, L. Z. 1049
Wang, T. J. 1049
Wang, W. 751
West, A. P. 65
Whitaker, N. 501
Williams, A. 501
Woo, T. C. 873
Wozny, M. J. 989
Wright, P. K. 621
Wu, J. 687

Xiong, Y. 137

Yamada, A. 251
Yamamoto, T. 1049
Yang, J. 113
Yang, X. 35, 749
Ye, X. G. 1023
Yin, Z. 137
Yu, K. M. 91
Yu, L. 475
Yuen, M. M. F. 91

Zhang, C. 103, 913
Zhang, P. 103, 913
Zhang, T. 687
Zhang, X. 687
Zhang, Y. F. 183, 605
Zhou, J. 687
Zhu, X. 903

Keyword index

5-axis machining 57
2-D cutting 879
3D convex polyhedron 873
2-Stage extrusion 91

Acceleration control 155
Adaptive slicing 65
Algorithms 873
Analytic function 813
Animation 279
APIs 531
Approximate conversion 125
Approximation 813
Arc splines 35
Architecture 1111
ASME/ANSI Y14.5 721
Assembly 279
Assembly models 637
Automatic 233

B-Rep 439
B-spline 753
Basic-solid 91
Bézier curve 125, 1049
Boundary extraction 571
Boundary tracing 571

CAD models 925
CAD 81, 699
CAGD 893
Calibration 331
Case-based design 1111
Casting and forging parts 605
Chaotic dynamics 349
Closed B-spline curve interpolation 967
Clothoid curve 1049
CNC machine tool 307
Collaboration design 637
Collision detection 331
Component requirements 425
Composites 1035
Computational geometry 801
Computer numerical control 1
Conceptual design 699
Conic section 867
Constrained deformation 103
Constrained optimization 903
Constrained scaling 103
Constrained stretching 103
Constrained triangulation 211
Constraint solving 475
Constraints 81, 531, 581
Contour-parallel tool paths 739
Crease enhancement 789
CT-scanning 1091
Curve-fairness 45
Curve/surface fairing 913
Curves and surfaces 167
Curvilinear mesh generation 199
Cutter-path generation 1009
Cutting 233
Cutting area 571

Damping factor 45
Data fitting 35
Decomposing 621
Deformation 893
Delaunay meshes 263
Derivative 321
Design automation 1073, 1111
Design for manufacturing 425
Design history 687
Design modeling 545
Design modelling 511
Design synthesis 699
Developing 581
DFT filter 45
Difference fairing 45
Dijkstra's algorithm 801
Dimension-driven geometry 475
Dimensioning 949
Dynamics 403

Energy minimization 903
Engineering drawings 1059
EOD filter 45
Even-order difference 45
Evolutionary techniques 367
Excess-solid 91
Expert system 949
EXPRESS 501
Extrusion-solid 91
F-rep 379
Fabric drape 1035
Face clustering 251
FEA 221
Feature and history based design 687
Feature-based design 425
Feature extraction 605, 949, 1091
Feature functions 425
Feature recognition 137, 221, 455, 671, 1023, 1073
Feature volumes 455
Feedrate accuracy 155
Filtering 91
Finite element analysis 251
Fitting 167
Five-axis machining 1
Form features 621, 637, 653
Form tolerance 853
Free-form curve interpolator 307
Freeform surfaces 621
Function-to-form mapping 699
Fuzzy logic 425

G^1 end-points interpolation 867
Gaussian sphere 975
Generic design 81
Genetic algorithm 879
Geodesics 581
Geometric constraints taxonomy and representation 17
Geometric design 403
Geometric dimensioning and tolerances 721
Geometric modeling 17, 801, 893
Geometric reasoning 137

Haptic sculpting 403
Hausdorff distance 867
Hexahedral 233
Hexahedral meshing 221
Hexahedral-dominant 211
High-speed machining 155
Highlight line 903

Highlight lines 103
Hodograph 321
Implicit surface 379
Implicit surfaces 113
Imprint curves 57
Inclusion relationship 571
Injection moulding 1073
Inspection 653
Intelligent CAD 949
Interaction techniques 403
Interactive design 367
Interfaces 531
Interference detection 561
Interoperability 501, 545
Interpolation 1, 293, 753, 913
Intersection 813
Intersection curve topology 825
Intersections 455
ISO 1101 721
Isosurface 379
Iterated function systems 349

Jacobian rank deficiency 113

Knowledge representation 545

Languages 489
Longest-edge based algorithms 263

Mapping algorithms 1035
Mappings 521
Maximum norm 867
Merging 125
Mesh 925
Mesh generation 199, 211, 233, 251
Mesh regularization 789
Mesh simplification 251
Mesh smoothing 789
Meshes 779
Minimal-energy curve 35
Minimal rotation 279
Mold design 137
Mold machining 561
Motif analysis 1091
Mould design 1023
Multiresolution 779

NC milling 621, 653, 671
Nesting 879
Net of curves 753
Node and knot placement 967
Nonlinear diffusion 789
Normal 753
NURBS 593, 903
NURBS boundary Gregory patch 293
NURBS curve 1049
NURBS surfaces 103

Object-oriented representation 699
Offset 893
Offset surface 307
Optimal control 167
Optimal quality triangulation 263
Optimization 103, 581, 867

Parameter shifting 967
Parameterization 779
Parameterization independence 767
Parametric curves 155
Parametric data exchange 17
Parametric design 81
Parametric modeling 475
Parametrized models 531
PDE method 767
Physics-based modeling 403
Pick feed 307
Pocketing 739
Point-sequence curve 45
Point set fairing 35
Poisson distribution 813
Polyhedral mesh 183
Polyhedral surface 801
Polyhedron 279
Procedural models 531
Process mapping 605
Process planning 65, 621, 653, 671
Product data exchange 489, 501, 521, 531, 545
Product models 501, 511, 531, 545
p-Version analysis 199
PWID offset 739
Pythagorean-hodograph curves 155

Quadratic 233

Rapid prototyping 331, 825
Rational Bézier curve and surface 321
Real-time CNC interpolators 155
Reconstruction 1059
Remeshing 779
Re-parameterisation 251
Reparameterization 293
Reverse engineering 183, 593, 1091

Scallop height 307
Screw motion 279
Segmentation 1091
Shape control 893
Shape handle 753
Shape modification 903
Shortest path 801
Simplification 925
Smoothing 167, 233
Smoothness 913
Solid modeling 113, 221, 1059
Solid reconstruction 91
Solution-solid 91
Spanning line segments 873
Splines curves/surfaces 913
STEP 489, 521
Stereolithography 65
Strain energy 103, 913
Streamline modeling 975
Subdivision 103, 753, 813
Subdivision surface 975
Subdivision surfaces 779
Surface fairing 767
Surface fitting 593
Surface modeling 975
Surface-plane intersection 825
Surface slicing 825
Surfaces 455
Swept region 279
Swept surface 893
Swept volume 113
Symmetric chaos 349
Symmetry 349
Synthetic carving 379

Tangent vector blending 975
Taylor series coefficients 155
Texture mapping 581
Three-dimensional shape modelling 379
Tolerance modeling 853
Tolerance validation 721
Tolerance zone 853
Tool-creating support system 367
Tool path 307
Tool path generation 561
Tool path verification 57
Topological name 687
Triangulation 183, 439
Trimmed NURBS surfaces 439
Trimming 813
Trimming curves 103
Truncation error 155

Uncut removal 739
Undercut feature 1023

Variable feedrate 155
Virtual prototyping 137
Visibility pyramid 331
Volume decomposition 221

Wallpaper patterns 349
Wire-frame 1059
Woven preforms 1035

XML 489